

REMARKS/ARGUMENTS

Status of the Application

In the Non-Final Office Action mailed April 24, 2008 (*hereinafter*, "Office Action"), claims 20, 21, and 25-31 were rejected. In the present response, claim 20 was amended for clarity. Support for the amendments can be found in claim 20 as originally filed and throughout the specification. Applicants believe that no new matter was added through the amendments to claim 20.

Claims 30 and 31 were canceled without prejudice to or disclaimer of the subject matter therein.

Thus, claims 20, 21, and 25-29 are pending.

Applicants acknowledge and thank the Examiner for withdrawal of the rejections found in the October 1, 2007, Final Office Action.

Rejections Under 35 U.S.C. § 102

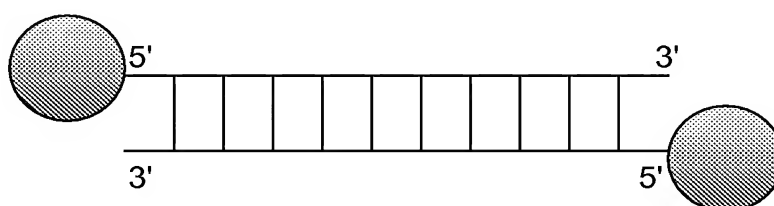
Claims 30 and 31 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ulmer (U.S. Patent No. 5,674,743). Applicants respectfully submit that the cancellation of these claims makes these rejections moot.

Rejections Under 35 U.S.C. § 103

Claims 20, 21, and 25-31 were rejected under 35 U.S.C. § 103(a) as being obvious over Alivisatos *et al.* (Nature 382:609-11 (1996)) in view of Niemeyer *et al.* (ChemBiochem 2:260-64 (2001)). Claims 20, 21, and 25-31 were rejected under 35 U.S.C. § 103(a) as being obvious over Kelley *et al.* (U.S. Patent No. 6,958,216) and in view of Niemeyer *et al.* Applicants respectfully traverse these rejections.

Applicants believe that the present clarifications to the claims and the explanations that follow should alleviate the Examiner's concerns as to the scope of the invention. Amended claim 20 has at least four requirements that neither Alivisatos *et al.* nor Kelley *et al.* can address. First, claim 20 requires that the geometric nanostructure has at least three nanoparticle-ligand complexes each attached to each other through the distal portions of each respective ligand. As noted in Applicants' Response to the October 1, 2007, Final Office Action, Kelley *et al.* and Alivisatos *et al.* teach perfectly complementary double-stranded DNA

complexes. Thus, assuming *arguendo* that Kelley *et al.* and/or Alivisatos *et al.* teach a complex comprising a DNA ligand attached at one 5' end of one strand of the double helix (or one 3' end) to one nanoparticle and attached to a second nanoparticle by the 5' end (or 3' end as the case may be) of the other strand of the double helix as illustrated by the figure below,¹ then at most a Kelley *et al.* and/or Alivisatos *et al.* geometric nanostructure can comprise only two nanoparticle-ligand complexes.



While the distinction between claim 20 and the cited references may seem as simple as a difference in numbers of complexes, the cited references do not provide any teaching as to how the skilled artisan should produce geometric nanostructures of more than two complexes.

Further, at least in relation to Alivisatos *et al.*, figure 1 therein clearly illustrates that the nanoparticle-ligand complexes are not bound to each other through their respective distal ends. At best, they can be described as being bound to the same DNA template, but this is not what claim 20 requires. In claim 20, the nanoparticle-ligand complexes are each affixed to each other through the distal portion of each respective ligand.

In relation to the first requirement, claim 20 also requires that the nanoparticle-ligand complexes must be arranged in an ordered geometric pattern. Outside of a linear pattern as shown in the figure above, neither Kelley *et al.* nor Alivisatos *et al.* describe how a skilled artisan could produce such structures. Because of this deficiency, the Examiner relies on the geometric shapes described in Niemeyer *et al.* Niemeyer *et al.*'s nanoparticle networks, however, rely on properties found in adjacent double-stranded DNA. All the experiments in Niemeyer *et al.* use double-stranded DNA (see the Experimental Section on pages 263-64), and the

¹For simplicity, the DNA in the figure is not shown as a helix.

effects studied in Niemeyer *et al.* are related to condensation of double-stranded DNA (see, e.g., page 261, 4th paragraph).

Claim 20 also requires that the DNA ligand be single-stranded. Applicants understand that double-stranded DNA is composed of two strands, which in isolation would each be considered a single strand of DNA. However, the terms single-stranded and double-stranded in relation to the present claims cannot be read in isolation. The single-stranded nature of the claimed DNA ligands permits structures beyond two nanoparticle-ligand complexes; two single strands of DNA forming double-stranded DNA provide no additional site for a third or more single strand of DNA to bind.

Thus, in light of the present amendments to the claim 20 and the differences between claim 20 and the cited references, Applicants respectfully submit that claim 20 and its dependent claims are nonobvious over Alivisatos *et al.* or Kelley *et al.* in view of Niemeyer *et al.* Removal of these obviousness rejections is thus respectfully requested.

SUMMARY

In view of the foregoing remarks, Applicants submit that this application is in condition for allowance. In order to expedite disposition of this case, the Examiner is invited to contact Applicants' representative at the telephone number listed below to resolve any remaining issues. Should there be a fee due which is not accounted for, please charge such fee to Deposit Account No. 04-1928 (E.I. du Pont de Nemours and Company).

Respectfully submitted,

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